

What is claimed is:

1. A gas distributor capable of distributing a gas across surfaces in a substrate processing chamber, the gas distributor comprising:

- (a) a hub comprising a gas inlet and a gas outlet;
- (b) a baffle extending radially outward from the hub, the baffle having opposing first and second surfaces;
- (c) first vanes on the first surface of the baffle; and
- (d) second vanes on the second surface of the baffle;

whereby the first vanes direct the received gas across a chamber surface and the second vanes direct the received gas across the second surface of the baffle.

2. A gas distributor according to claim 1 wherein the baffle further comprises an outer perimeter, and wherein each first vane comprises an arcuate plate that curves outward from the hub to the outer perimeter of the baffle.

3. A gas distributor according to claim 2 wherein each arcuate plate tapers from the hub to the outer perimeter of the baffle.

4. A gas distributor according to claim 1 wherein the hub comprises first and second channels, and the gas outlet comprises the terminus of the first channels and the terminus of the second channels.

5. A gas distributor according to claim 4 wherein the second vanes comprise a plurality of surfaces that are inclined to the second surface of the baffle, at least a portion of the inclined surfaces being below the terminus of the second channels.

6. A gas distributor according to claim 1 wherein the second vanes comprise pairs of inclined surfaces that are oriented to direct the gas across a sector of the second surface of the baffle.

7. A gas distributor according to claim 1 wherein the second vanes comprise a plurality of wedges.

8. A gas distributor according to claim 1 wherein the second vanes comprise surfaces inclined to the second surface of the baffle at an angle of about 5 degrees to about 60 degrees.

9. A gas distributor according to claim 1 wherein the hub comprises a gas feed-through tube capable of allowing a process gas to bypass the first and second vanes and enter the chamber.

10. A combination process and cleaning gas distributor comprising the gas distributor according to claim 1 to distribute a cleaning gas, and a process gas distributor having a process gas inlet and a showerhead gas distribution faceplate.

11. A gas distributor to distribute a gas from an external source across surfaces in a substrate processing chamber having a wall with a cavity, the gas distributor comprising:

(a) a hub that fits into the cavity in the wall of the chamber, the hub comprising (i) a plurality of first channels on an external surface of the hub that mates with the cavity, the first channels comprising openings and a terminus, the openings capable of receiving the gas from the external source; (ii) a plurality of second channels capable of receiving the gas from the terminus of the first channels; and (iii) a gas feed-through tube;

(b) a baffle plate extending radially outward from the hub, the baffle plate comprising a first and second surface, an outer perimeter, and an aperture capable of allowing passage of the gas along the second channels;

(c) first vanes on the first surface of the baffle plate, each first vane comprising an arcuate plate that curves outward from the hub;

(d) second vanes on the second surface of the baffle plate, each second vane comprising a surface inclined to the second surface of the baffle plate;

whereby the first vanes direct the gas across the surfaces of the chamber, the second vanes direct the gas across the second surface of the baffle plate, and the gas feed-through tube allows the gas to bypass the first and second set of vanes.

12. A gas distributor according to claim 11 wherein each arcuate plate tapers from the hub to the baffle plate outer perimeter.

13. A gas distributor according to claim 11 wherein at least a portion of the inclined surfaces are below the aperture.

14. A gas distributor according to claim 11 wherein the pairs of inclined surfaces are oriented to direct the gas across a sector of the second surface of the baffle plate.

15. A substrate processing apparatus comprising

- (a) a remote chamber to activate a gas;
- (b) a process chamber comprising chamber walls, interior chamber surfaces, a substrate support, a gas distributor, and a gas exhaust, the gas distributor being capable of receiving the gas from the remote chamber and distributing the gas (i) into the process chamber, (ii) along the chamber walls and interior chamber surfaces, and (iii) about the gas distributor, the gas distributor comprising:
 - (i) a hub comprising a gas inlet, a gas outlet, and a gas feed-through tube;
 - (ii) a baffle extending radially outward from the hub, the baffle having a opposing first and second surfaces;
 - (iii) a first vanes on the first surface of the baffle; and
 - (iv) a second vanes on the second surface of the baffle;whereby the first vanes direct the gas across the enclosing walls and interior chamber surfaces, the second vanes direct gas across the second surface of the baffle, and the gas feed-through tube allows a gas to bypass the first and second vanes.

16. A substrate processing apparatus according to claim 15 wherein the remote chamber comprises a gas inlet, gas activator, and a gas outlet.

17. A substrate processing apparatus according to claim 15 wherein the first vanes are capable of distributing an energized cleaning gas from the remote chamber along the chamber walls and interior chamber surfaces.

18. A substrate processing apparatus according to claim 15 wherein the second vanes are capable of distributing an energized cleaning gas from the remote chamber about the gas distributor.

19. A substrate processing apparatus according to claim 15 wherein the gas feed-through tube is capable of distributing an energized process gas from the remote chamber into the process chamber.

20. A method of cleaning a surface in a substrate processing chamber, the chamber comprising a gas distributor, the method comprising:

(a) coupling energy to a cleaning gas in a remote chamber to form an energized cleaning gas;

(b) directing a first portion of the energized cleaning gas across a chamber surface; and

(c) directing a second portion of the energized cleaning gas across a surface of the gas distributor facing the substrate;

whereby the first portion of the energized cleaning gas cleans the chamber surface and the second portion of the energized cleaning gas cleans the gas distributor surface facing the substrate.

21. A method according to claim 21 wherein (b) and (c) occur simultaneously.